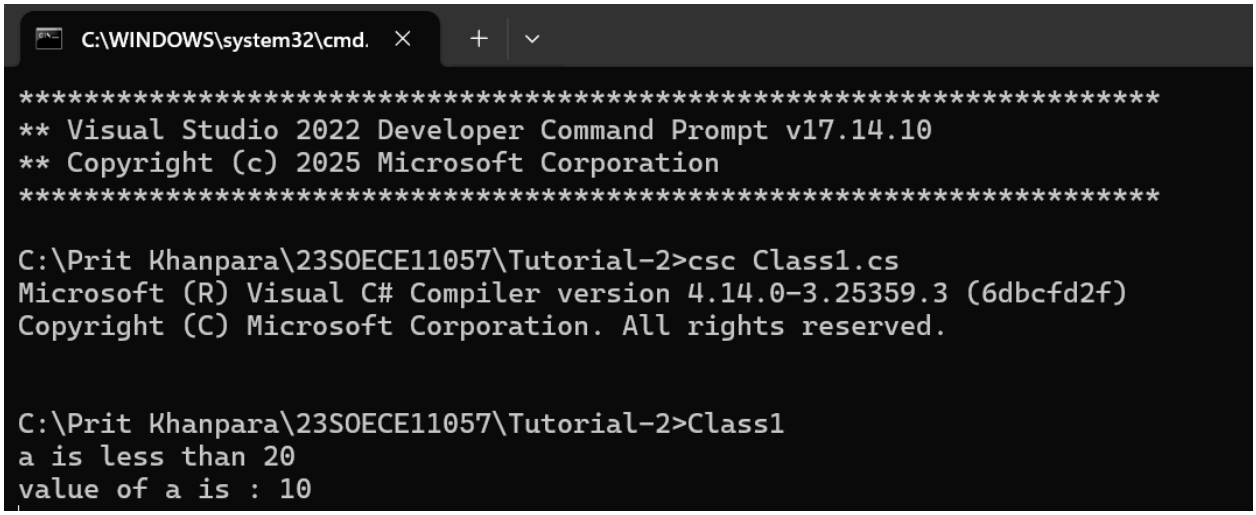
Tutorial – II

1 : Predict and write output for the following code.

```
using System;
namespace DecisionMaking
{
    class Program
    {
    static void Main(string[] args)
    {
    /* local variable definition */
    int a = 10;
    /* check the boolean condition using if statement */
    if (a < 20)
    {
        /* if condition is true then print the following */
        Console.WriteLine("a is less than 20");
    }
    Console.WriteLine("value of a is : {0}", a);
    Console.ReadLine();
    }
```

```
    }
}
```

OUTPUT :-



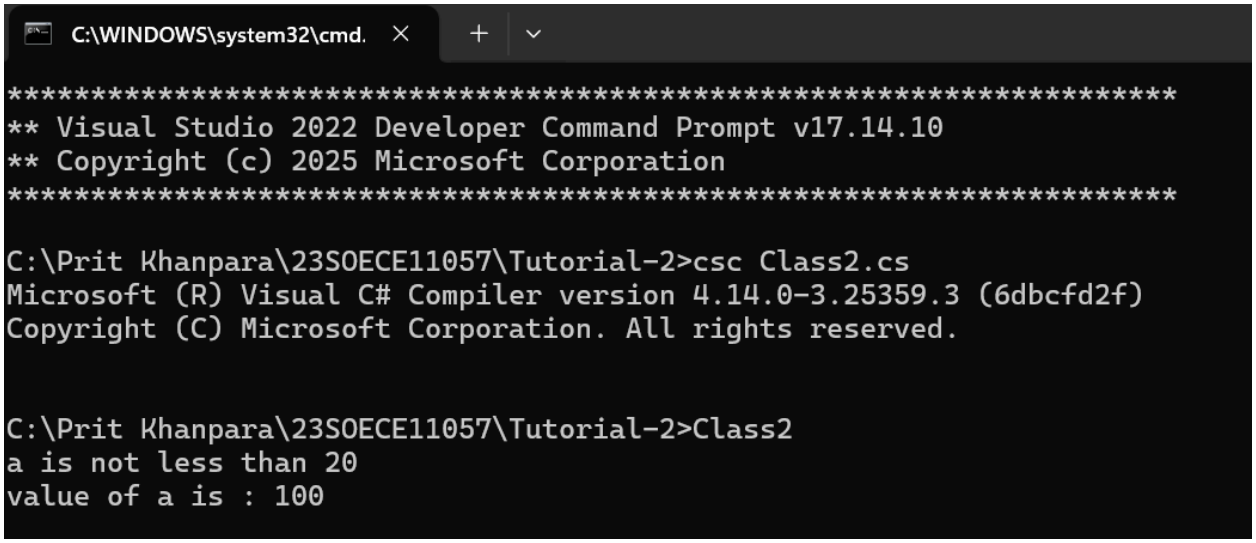
2 : Write missing statement to get the desired output.

CODE :-

```
using System;

namespace DecisionMaking
{
   class Program
   {
      static void Main(string[] args)
      {
         /* local variable definition */
         int a = 100;

         /* check the boolean condition */
         if (a < 20)
         {
            /* if condition is true then print the following */
            Console.WriteLine("a is less than 20");
         }
         else
         {
```

```
            /* if condition is false then print the following */
            Console.WriteLine("a is not less than 20"); // Missing statement-1
        }

        Console.WriteLine("value of a is : {0}", a); // Missing statement-2

        Console.ReadLine();
    }
  }
}
```

OUTPUT :-



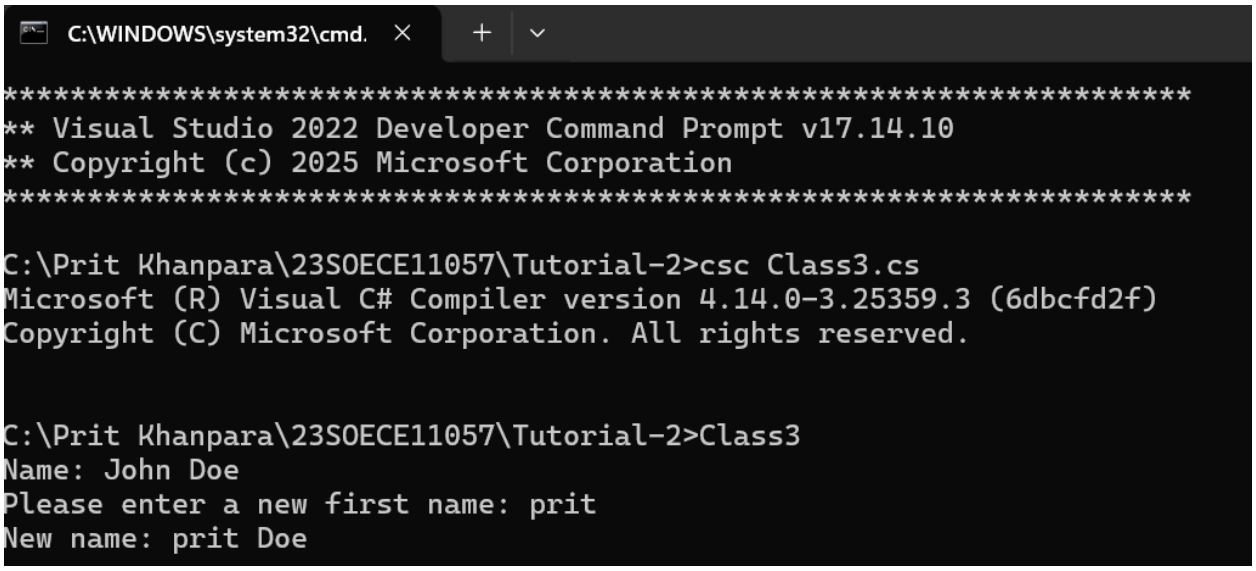
3 : Correct the following code and write output for the corrected code.

CODE :-

```
using System;

namespace ConsoleApplication1
{
   class Program
   {
      static void Main(string[] args)
      {
         // Strings should be used instead of char for names
         string firstName = "John";
```

```
            string lastName = "Doe";

            Console.WriteLine("Name: " + firstName + " " + lastName);

            Console.Write("Please enter a new first name: ");
            firstName = Console.ReadLine();

            Console.WriteLine("New name: " + firstName + " " + lastName);

            Console.ReadLine();
        }
    }
}
```

OUTPUT :-



4 : Input two number A and B. perform different operations using different operators and different data types available in C#. (Note : Follow all the operators and data types to do above task. Use Online help whenever necessary.)

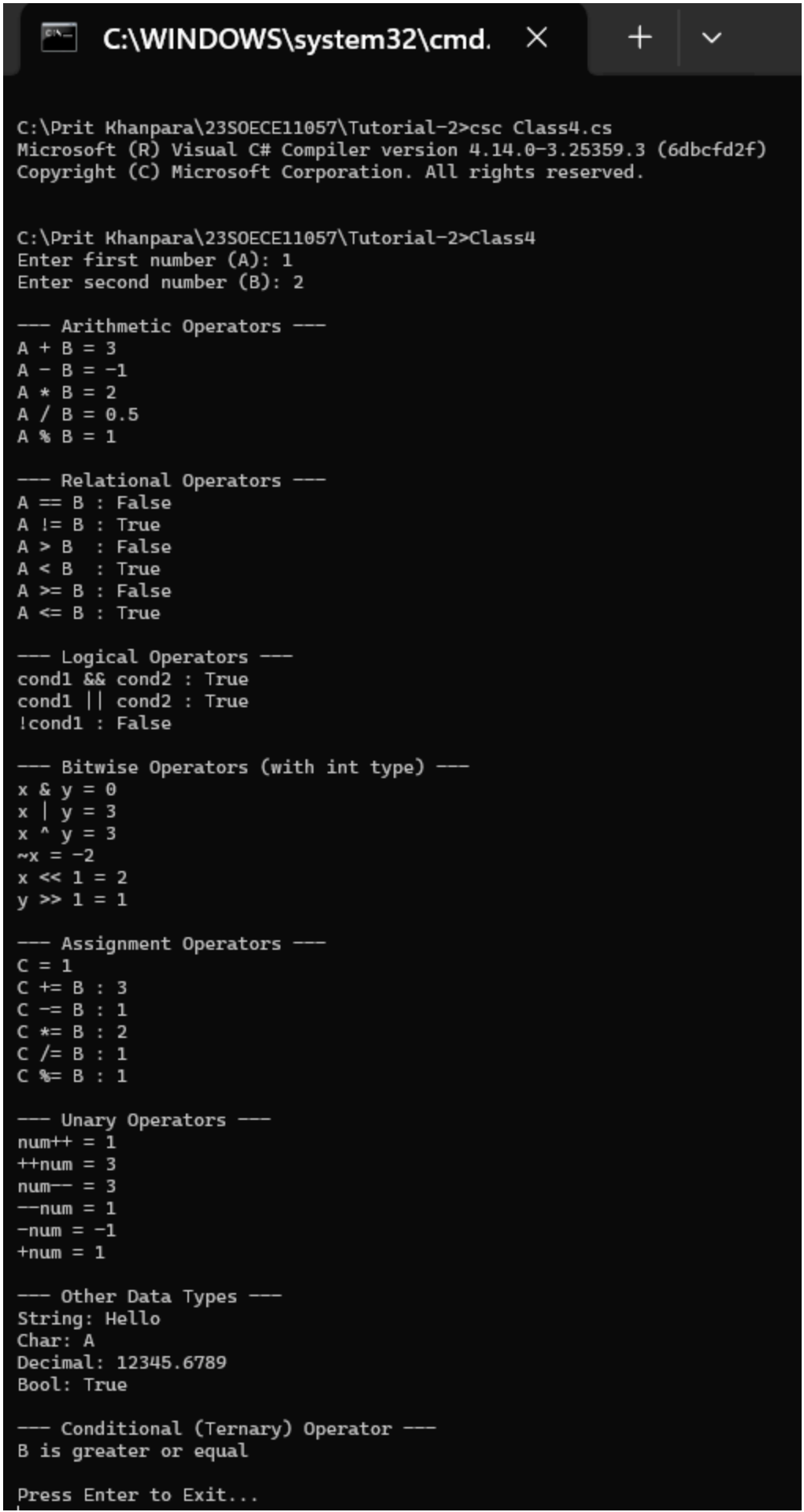
CODE :-

```
using System;

namespace OperatorAndDataTypesDemo
{
```

```
class Program
{
    static void Main(string[] args)
    {
        // Input two numbers
        Console.Write("Enter first number (A): ");
        double A = Convert.ToDouble(Console.ReadLine());

        Console.Write("Enter second number (B): ");
        double B = Convert.ToDouble(Console.ReadLine());

        Console.WriteLine("\n--- Arithmetic Operators ---");
        Console.WriteLine($"A + B = {A + B}");
        Console.WriteLine($"A - B = {A - B}");
        Console.WriteLine($"A * B = {A * B}");
        Console.WriteLine($"A / B = {A / B}");
        Console.WriteLine($"A % B = {A % B}");

        Console.WriteLine("\n--- Relational Operators ---");
        Console.WriteLine($"A == B : {A == B}");
        Console.WriteLine($"A != B : {A != B}");
        Console.WriteLine($"A > B  : {A > B}");
        Console.WriteLine($"A < B  : {A < B}");
        Console.WriteLine($"A >= B : {A >= B}");
        Console.WriteLine($"A <= B : {A <= B}");
        Console.WriteLine("\n--- Logical Operators ---");
        bool cond1 = A > 0;
        bool cond2 = B > 0;
        Console.WriteLine($"cond1 && cond2 : {cond1 && cond2}");
        Console.WriteLine($"cond1 || cond2 : {cond1 || cond2}");
        Console.WriteLine($"!cond1 : {!cond1}");
        Console.WriteLine("\n--- Bitwise Operators (with int type) ---");
        int x = (int)A;
        int y = (int)B;
        Console.WriteLine($"x & y = {x & y}");
        Console.WriteLine($"x | y = {x | y}");
        Console.WriteLine($"x ^ y = {x ^ y}");
        Console.WriteLine($"~x = {~x}");
        Console.WriteLine($"x << 1 = {x << 1}");
        Console.WriteLine($"y >> 1 = {y >> 1}");
```

```
            Console.WriteLine("\n--- Assignment Operators ---");
            double C = A; // simple assignment
            Console.WriteLine($"C = {C}");
            C += B;  // C = C + B
            Console.WriteLine($"C += B : {C}");
            C -= B;  // C = C - B
            Console.WriteLine($"C -= B : {C}");
            C *= B;  // C = C * B
            Console.WriteLine($"C *= B : {C}");
            C /= B;  // C = C / B
            Console.WriteLine($"C /= B : {C}");
            C %= B;  // C = C % B
            Console.WriteLine($"C %= B : {C}");
            Console.WriteLine("\n--- Unary Operators ---");
            int num = (int)A;
            Console.WriteLine($"num++ = {num++}");
            Console.WriteLine($"++num = {++num}");
            Console.WriteLine($"num-- = {num--}");
            Console.WriteLine($"--num = {--num}");
            Console.WriteLine($"-num = {-num}");
            Console.WriteLine($"+num = {+num}");
            Console.WriteLine("\n--- Other Data Types ---");
            string message = "Hello";
            char letter = 'A';
            decimal preciseValue = 12345.6789M;
            Console.WriteLine($"String: {message}");
            Console.WriteLine($"Char: {letter}");
            Console.WriteLine($"Decimal: {preciseValue}");
            Console.WriteLine($"Bool: {cond1}");
            Console.WriteLine("\n--- Conditional (Ternary) Operator ---");
            string result = (A > B) ? "A is greater" : "B is greater or equal";
            Console.WriteLine(result);

            Console.WriteLine("\nPress Enter to Exit...");
            Console.ReadLine();
        }
    }
}
```

OUTPUT :-

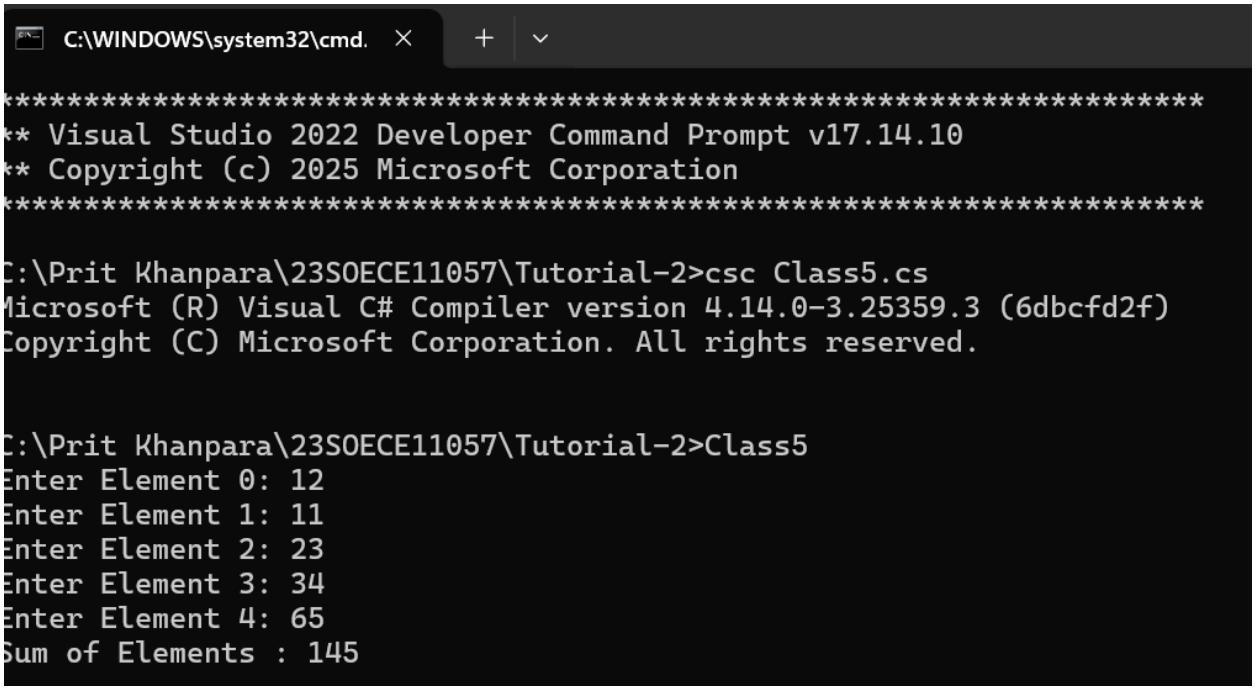

C:\WINDOWS\system32\cmd.
C:\Prit Khanpara\23SOECE11057\Tutorial-2>csc Class4.cs
Microsoft (R) Visual C# Compiler version 4.14.0-3.25359.3 (6dbcfd2f)
Copyright (C) Microsoft Corporation. All rights reserved.
C:\Prit Khanpara\23SOECE11057\Tutorial-2>Class4
Enter first number (A): 1
Enter second number (B): 2
--- Arithmetic Operators ---
A + B = 3
A - B = -1
A * B = 2
A / B = 0.5
A % B = 1
--- Relational Operators ---
A == B : False
A != B : True
A > B : False
A < B : True
A >= B : False
A <= B : True
--- Logical Operators ---
cond1 && cond2 : True
cond1 || cond2 : True
!cond1 : False
--- Bitwise Operators (with int type) ---
x & y = 0
x | y = 3
x ^ y = 3
~x = -2
x << 1 = 2
y >> 1 = 1
--- Assignment Operators ---
C = 1
C += B : 3
C -= B : 1
C *= B : 2
C /= B : 1
C %= B : 1
--- Unary Operators ---
num++ = 1
++num = 3
num-- = 3
--num = 1
-num = -1
+num = 1
--- Other Data Types ---
String: Hello
Char: A
Decimal: 12345.6789
Bool: True
--- Conditional (Ternary) Operator ---
B is greater or equal
Press Enter to Exit...

5 : Rearrange the given code to correct the program. The resultant program will be to enter 5 elements into an array and print sum of these elements.

CODE :-

```
using System;

namespace ConsoleApplication1
{
   class Program
   {
      static void Main(string[] args)
      {
         int[] arr = new int[5]; // Declare array
         int sum = 0;            // Initialize sum

         // Input loop
         for (int i = 0; i < 5; i++)
         {
            Console.Write("Enter Element {0}: ", i);
            string str = Console.ReadLine();
            arr[i] = Convert.ToInt32(str);
         }

         // Sum loop
         for (int i = 0; i < 5; i++)
         {
            sum = sum + arr[i];
         }

         Console.WriteLine("Sum of Elements : {0}", sum);

         Console.ReadLine();
      }
   }
}
```

OUTPUT :-

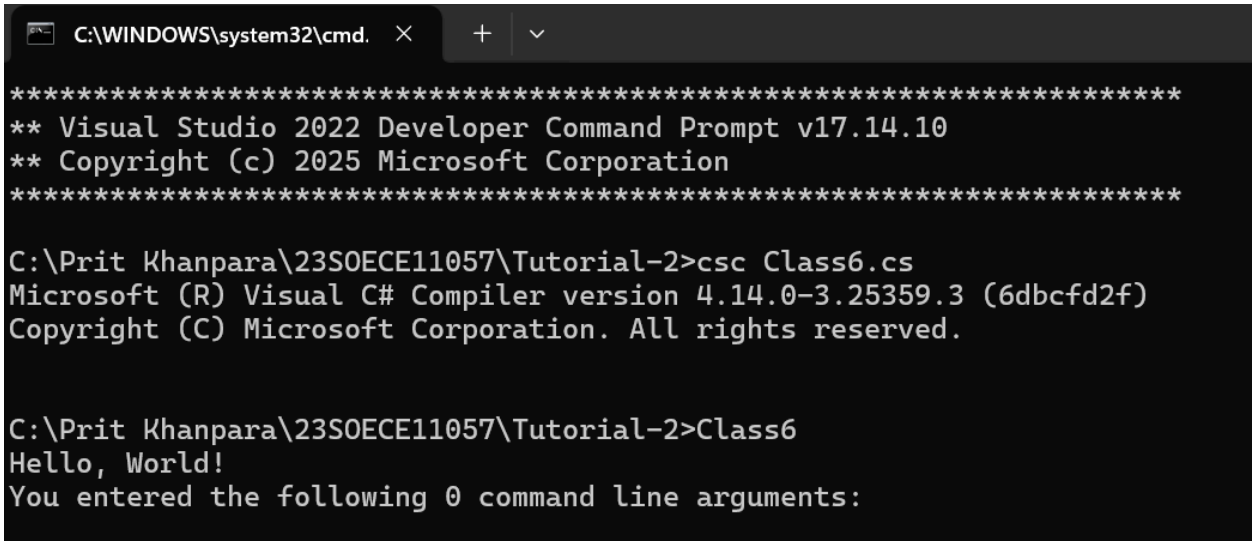


6: Write missing statement to get the desired output.

CODE :-

```
using System;

public class Hello3
{
  public static void Main(string[] args)
  {
    Console.WriteLine("Hello, World!");
    Console.WriteLine("You entered the following {0} command line arguments:",
      args.Length);

    // Missing statement-1
    for (int i = 0; i < args.Length; i++)
    {
       // Missing statement-2
       Console.WriteLine(args[i]);
    }
  }
}
```

OUTPUT :-



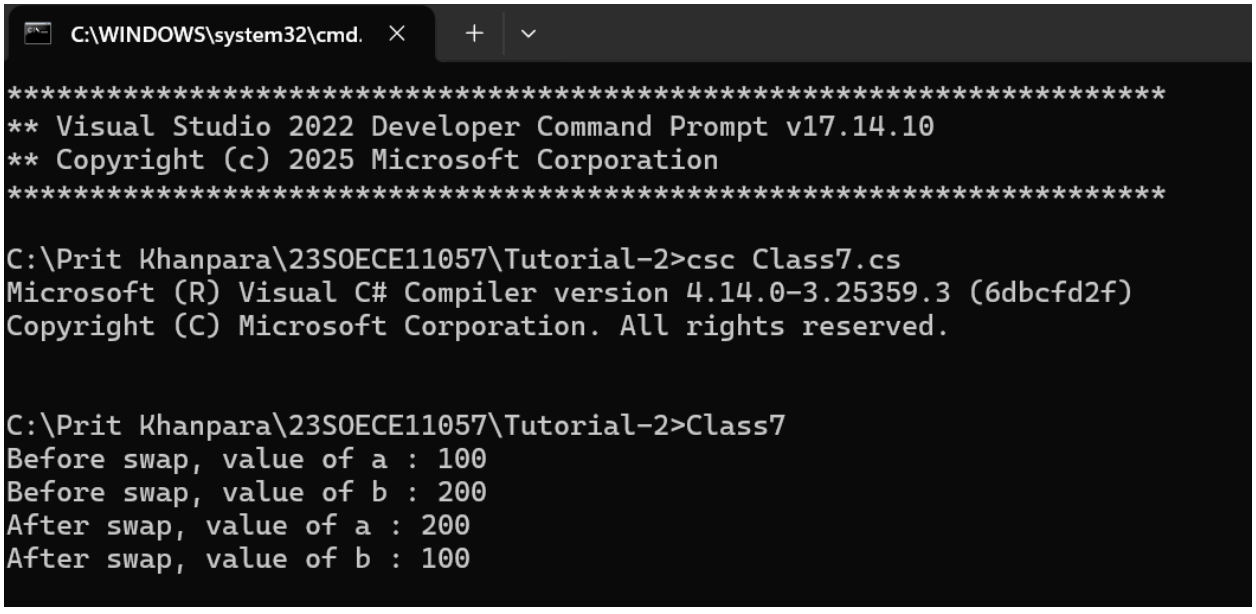
7 : Predict and write the output of the given code.

CODE :-

```
using System;

namespace CalculatorApplication
{
   class NumberManipulator
   {
      public void swap(ref int x, ref int y)
      {
         int temp;
         temp = x; // save the value of x
         x = y;    // put y into x
         y = temp; // put temp into y
      }
   }

   class TestRef
   {
      static void Main(string[] args)
      {
```

```
            NumberManipulator n = new NumberManipulator();

            // local variable definition
            int a = 100;
            int b = 200;

            Console.WriteLine("Before swap, value of a : {0}", a);
            Console.WriteLine("Before swap, value of b : {0}", b);

            // calling a function to swap the values
            n.swap(ref a, ref b);

            Console.WriteLine("After swap, value of a : {0}", a);
            Console.WriteLine("After swap, value of b : {0}", b);

            Console.ReadLine(); // wait for user to press a key
        }
    }
}
```

OUTPUT :-



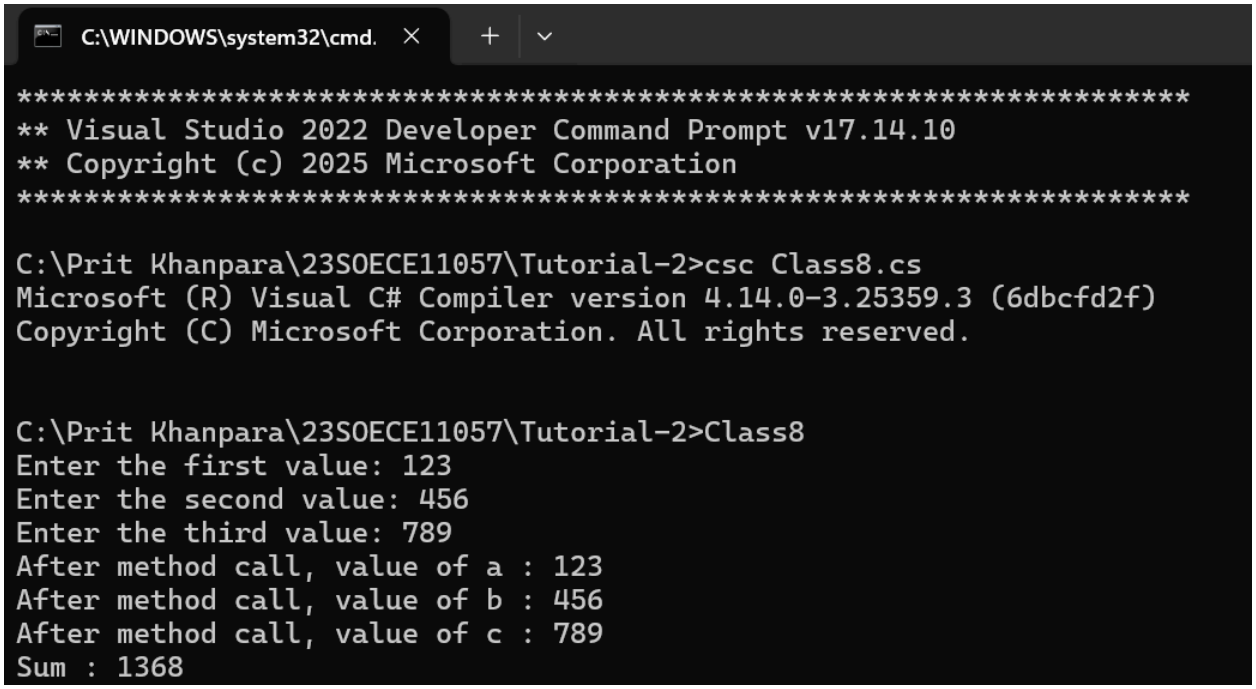
8 : Find out error code and correct it. Write the output of the corrected code.

CODE :-

```
using System;

namespace CalculatorApplication
{
   class NumberManipulator
   {
      public int getValues(out int x, out int y, out int z)
      {
         Console.Write("Enter the first value: ");
         x = Convert.ToInt32(Console.ReadLine());

         Console.Write("Enter the second value: ");
         y = Convert.ToInt32(Console.ReadLine());

         Console.Write("Enter the third value: ");
         z = Convert.ToInt32(Console.ReadLine());

         int sum = x + y + z;
         return sum;
      }
   }

   class TestOut
   {
      static void Main(string[] args)
      {
         NumberManipulator n = new NumberManipulator();

         // local variable definition
         int a, b, c, sum;

         // calling a function to get the values
         sum = n.getValues(out a, out b, out c);

         Console.WriteLine("After method call, value of a : {0}", a);
         Console.WriteLine("After method call, value of b : {0}", b);
         Console.WriteLine("After method call, value of c : {0}", c);
         Console.WriteLine("Sum : {0}", sum);
```

```
        Console.ReadLine(); // wait for user to press a key
    }
  }
}
```

OUTPUT :-



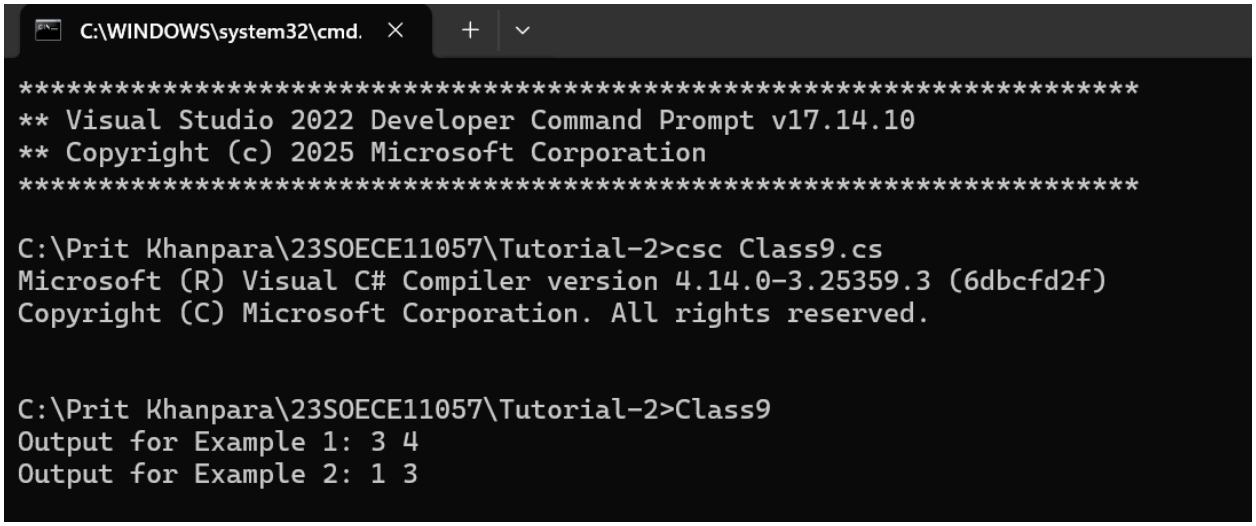
9 : Given an array A containing 2*N+2 positive numbers, out of which 2*N numbers exist in pairs whereas the other two number occur exactly once and are distinct. Find the other two numbers.

CODE :-

```
using System;

class Program
{
   static void FindTwoUnique(int[] arr, int n)
   {
      int xor = 0;

      // Step 1: XOR of all elements
      for (int i = 0; i < 2 * n + 2; i++)
         xor ^= arr[i];
```

```
        // Step 2: Get rightmost set bit
        int setBit = xor & -xor;

        int x = 0, y = 0;

        // Step 3: Divide numbers into two groups
        for (int i = 0; i < 2 * n + 2; i++)
        {
            if ((arr[i] & setBit) != 0)
                x ^= arr[i];
            else
                y ^= arr[i];
        }

        // Step 4: Print result in sorted order
        if (x < y)
            Console.WriteLine(x + " " + y);
        else
            Console.WriteLine(y + " " + x);
    }

    static void Main()
    {
        // Example 1
        int[] arr1 = { 1, 2, 3, 2, 1, 4 };
        int N1 = 2;
        Console.Write("Output for Example 1: ");
        FindTwoUnique(arr1, N1);

        // Example 2
        int[] arr2 = { 2, 1, 3, 2 };
        int N2 = 1;
        Console.Write("Output for Example 2: ");
        FindTwoUnique(arr2, N2);
    }
}
```

OUTPUT :-



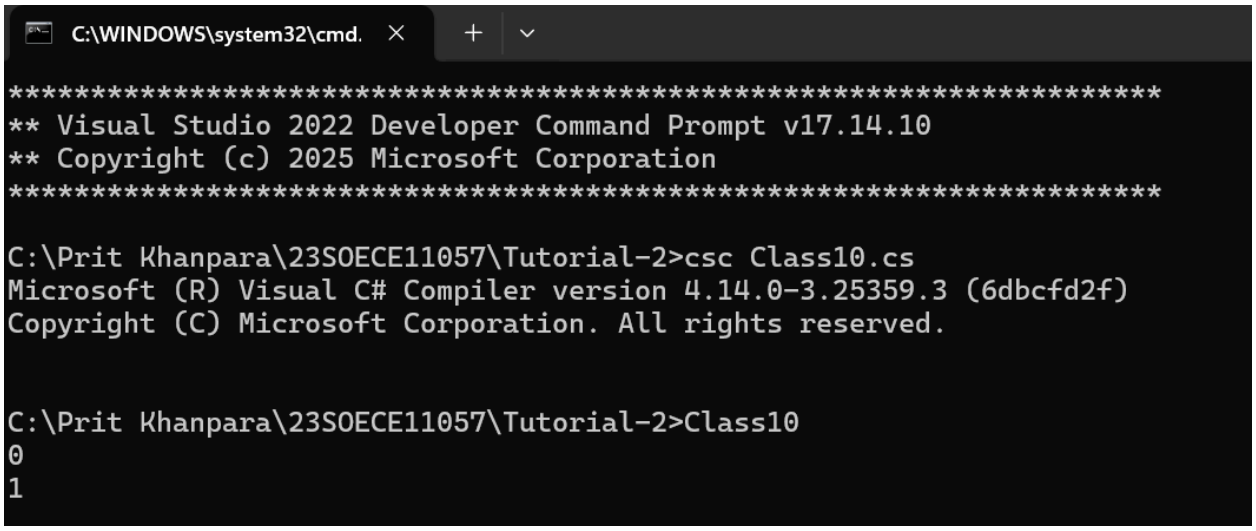
10: Given a matrix mat[][] of size N x M, where every row and column is sorted in increasing order, and a number X is given. The task is to find whether element X is present in the matrix or not.

CODE :-

```
using System;

class Program
{
    static int matSearch(int[,] mat, int N, int M, int X)
    {
        int row = 0, col = M - 1;

        while (row < N && col >= 0)
        {
            if (mat[row, col] == X)
                return 1;
            else if (mat[row, col] > X)
                col--; // move left
            else
                row++; // move down
        }

        return 0; // not found
```

```
    }

    static void Main()
    {
        // Example 1
        int[,] mat1 = { { 3, 30, 38 }, { 44, 52, 54 }, { 57, 60, 69 } };
        Console.WriteLine(matSearch(mat1, 3, 3, 62)); // Output: 0

        // Example 2
        int[,] mat2 = { { 18, 21, 27, 38, 55, 67 } };
        Console.WriteLine(matSearch(mat2, 1, 6, 55)); // Output: 1
    }
}
```

OUTPUT :-



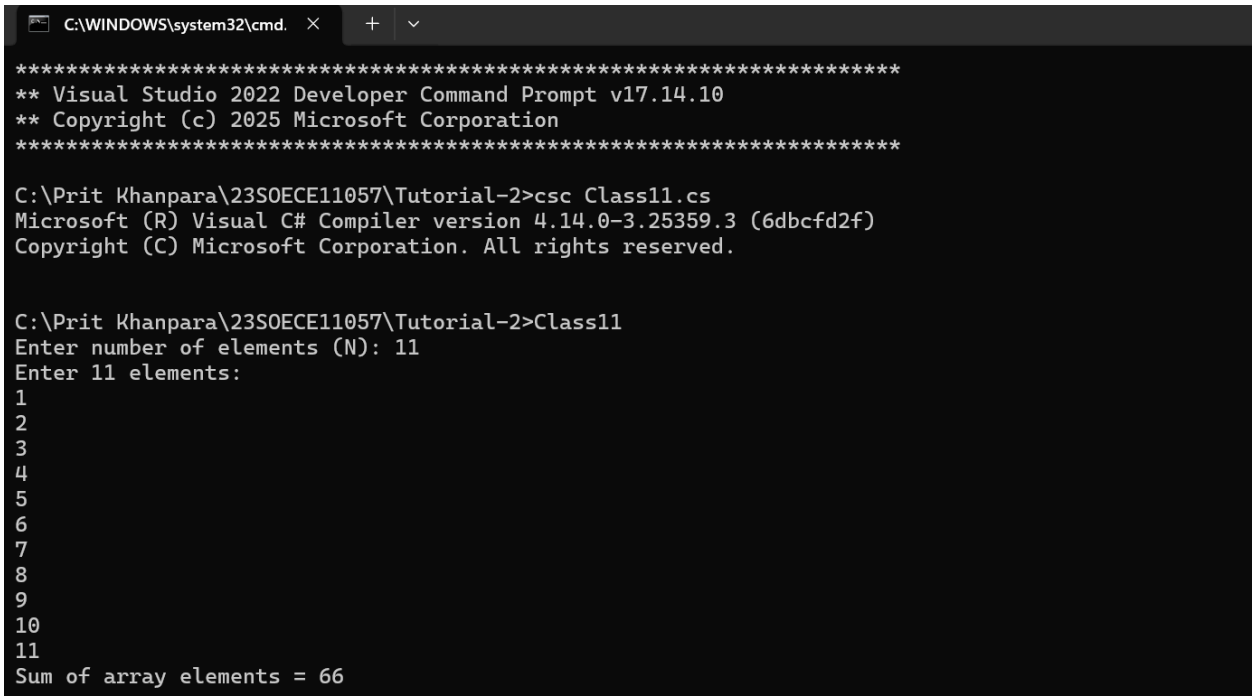
11: Write a program to find the sum of N elements of an Array.

CODE :-

```
using System;

class Program
{
    static void Main()
    {
        Console.Write("Enter number of elements (N): ");
```

```
        int N = Convert.ToInt32(Console.ReadLine());

        int[] arr = new int[N];
        int sum = 0;

        Console.WriteLine("Enter " + N + " elements:");

        for (int i = 0; i < N; i++)
        {
            arr[i] = Convert.ToInt32(Console.ReadLine());
            sum += arr[i];
        }

        Console.WriteLine("Sum of array elements = " + sum);
    }
}
```

OUTPUT :-

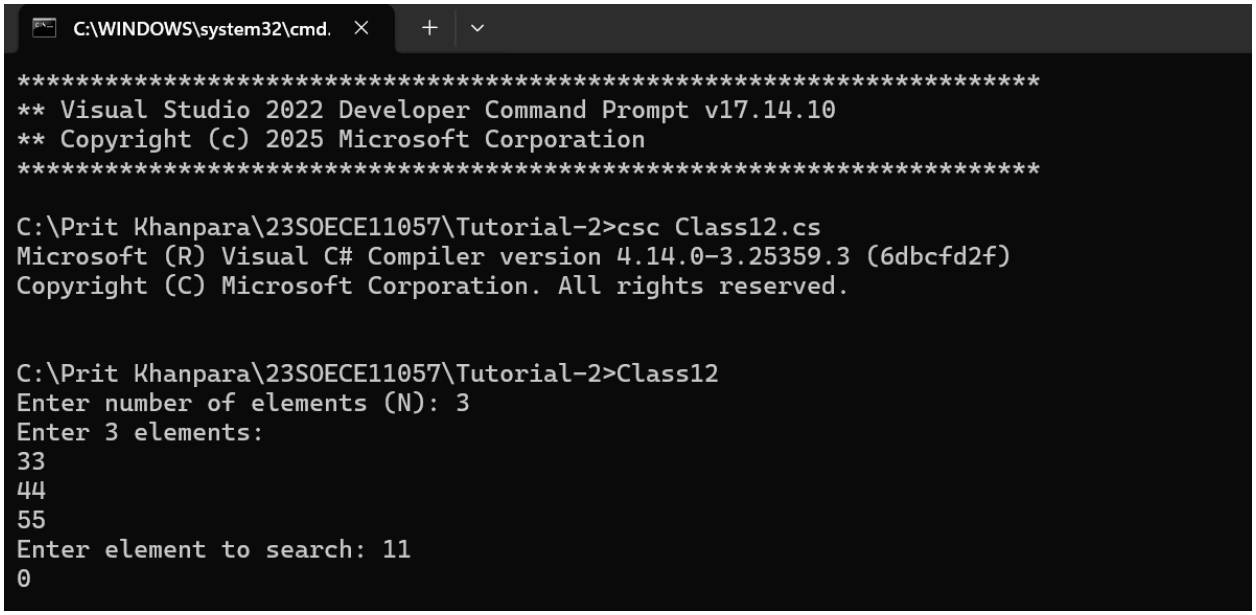


12: Write a program to find the element from an Array and print 1 if element is found else print 0.

CODE :-

```
using System;

class Program
{
    static void Main()
    {
        Console.Write("Enter number of elements (N): ");
        int N = Convert.ToInt32(Console.ReadLine());

        int[] arr = new int[N];

        Console.WriteLine("Enter " + N + " elements:");
        for (int i = 0; i < N; i++)
        {
            arr[i] = Convert.ToInt32(Console.ReadLine());
        }

        Console.Write("Enter element to search: ");
        int X = Convert.ToInt32(Console.ReadLine());

        int found = 0;

        for (int i = 0; i < N; i++)
        {
            if (arr[i] == X)
            {
                found = 1;
                break;
            }
        }

        Console.WriteLine(found);
    }
}
```

OUTPUT :-



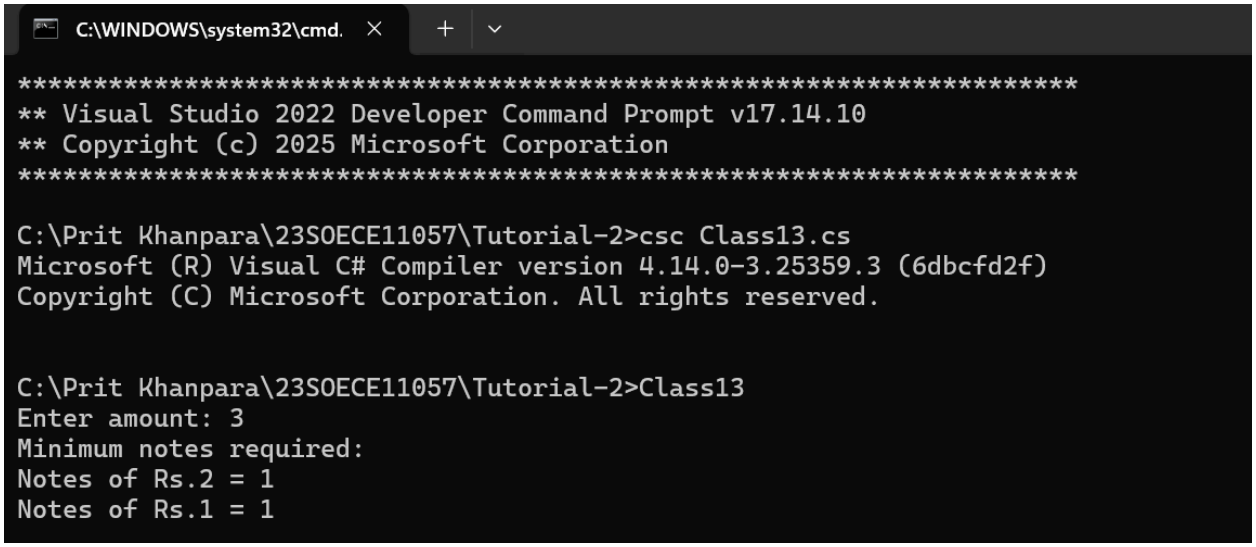
13. Write a Program that will accept the amount and find how many minimum no of notes you required for that.
(Using the rupee notes of 1, 2, 5, 10, 20, 50, 100, 200, 500, 2000)
Input: 5748
Output:
Notes of Rs.2000 = 2 Notes of Rs.500 = 3 Notes of Rs.200 = 1
Notes of Rs.20 = 2 Notes of Rs.10 = 0 Notes of Rs.5 = 1
Notes of Rs.2 = 1 Notes of Rs.1 = 1

CODE :-

```
using System;

class Program
{
    static void Main()
    {
        int[] notes = { 2000, 500, 200, 100, 50, 20, 10, 5, 2, 1 };

        Console.Write("Enter amount: ");
        int amount = Convert.ToInt32(Console.ReadLine());

        Console.WriteLine("Minimum notes required:");

        foreach (int note in notes)
```

```
        {
            int count = amount / note;
            if (count > 0)
            {
                Console.WriteLine("Notes of Rs." + note + " = " + count);
                amount %= note;
            }
        }
    }
}
```

OUTPUT :-

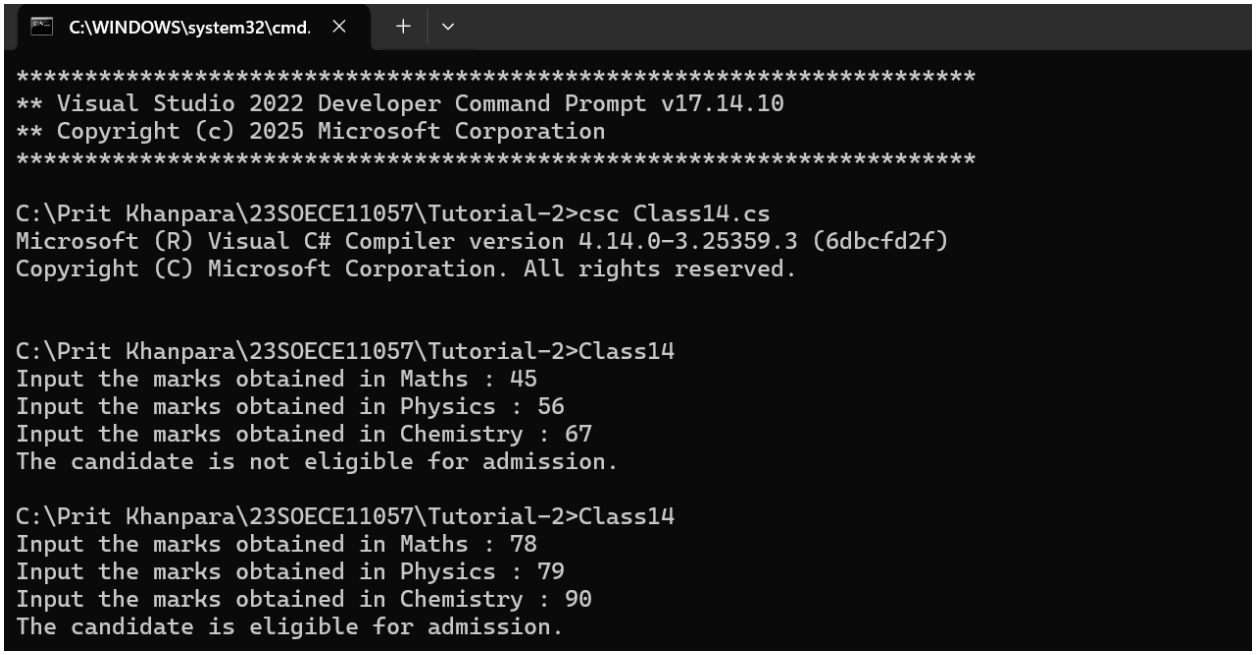


14. Write a Program to find the eligibility of admission for a professional course based on the following criteria:
Marks in Maths >=65
Marks in Phy >=55
Marks in Chem>=50 and
Total in all three subject >=180 or
Total in Math and Physics >=140
INPUT:
Input the marks obtained in Maths :72
Input the marks obtained in Physics :65
Input the marks obtained in Chemistry :51

CODE :-

```
using System;

class Program
{
    static void Main()
    {
        Console.Write("Input the marks obtained in Maths : ");
        int maths = Convert.ToInt32(Console.ReadLine());

        Console.Write("Input the marks obtained in Physics : ");
        int physics = Convert.ToInt32(Console.ReadLine());

        Console.Write("Input the marks obtained in Chemistry : ");
        int chemistry = Convert.ToInt32(Console.ReadLine());

        int totalAll = maths + physics + chemistry;
        int totalMathPhy = maths + physics;

        if (maths >= 65 && physics >= 55 && chemistry >= 50 &&
            (totalAll >= 180 || totalMathPhy >= 140))
        {
            Console.WriteLine("The candidate is eligible for admission.");
        }
        else
        {
            Console.WriteLine("The candidate is not eligible for admission.");
        }
    }
}
```

OUTPUT :-



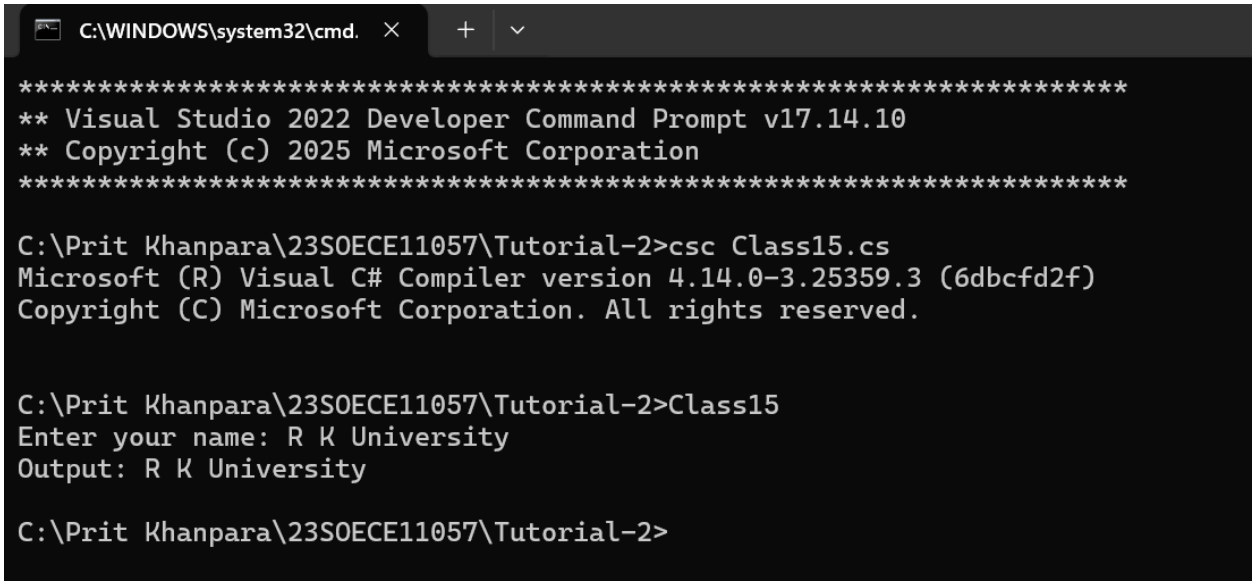
15.Write a Program which accepts name from the user and prints the same

INPUT : R K University
OUTPUT: R K University

CODE :-

```
using System;

class Program
{
   static void Main()
   {
      Console.Write("Enter your name: ");
      string name = Console.ReadLine();

      Console.WriteLine("Output: " + name);
   }
}
```

OUTPUT :-


C:\WINDOWS\system32\cmd.
****
** Visual Studio 2022 Developer Command Prompt v17.14.10
** Copyright (c) 2025 Microsoft Corporation
****
C:\Prit Khanpara\23SOECE11057\Tutorial-2>csc Class15.cs
Microsoft (R) Visual C# Compiler version 4.14.0-3.25359.3 (6dbcfd2f)
Copyright (C) Microsoft Corporation. All rights reserved.
C:\Prit Khanpara\23SOECE11057\Tutorial-2>Class15
Enter your name: R K University
Output: R K University
C:\Prit Khanpara\23SOECE11057\Tutorial-2>